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Title: Investigating the Influence of Causal Attributions on Both the Worksheet and Checklist Versions of the HCR-20

Jennifer Murray[1*], Kathy E. Charles[1], David J. Cooke[2], Mary E. Thomson[2]

1. School of Life, Sport and Social Sciences, Edinburgh Napier University, Sighthill Campus, Sighthill Court, Edinburgh, EH11 4BN
2. Department of Psychology, Glasgow Caledonian University, 70 Cowcaddens Road, Glasgow, G4 0PP

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*Requests for reprints should be addressed to Jennifer Murray, School of Life, Sport and Social Sciences, Edinburgh Napier University, Sighthill Campus, Sighthill Court, Edinburgh, EH11 4BN, (tel: 0131 455 6224, email: j.murray2@napier.ac.uk).

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Abstract

Attribution theories suggest that when assessing an individual's actions, judgements are made about the cause of these behaviours and often these judgements focus on internal or external causal explanations. The current research investigated the effects of internal and external attribution on the scoring of the HCR-20 and the possibility of differences in scoring between two ways of using the HCR-20 (using the HCR-20 as a worksheet versus checklist). No differences were present in the scoring between the checklist versus worksheet. Attribution effects were present within the Historical Scale, Clinical Scale and overall scoring of the HCR-20. Ratings were higher within the internal attribution condition than the external one, indicating that judgements made using the HCR-20 are subject to attribution effects in a similar manner as unaided violence risk assessments.

Keywords: HCR-20, attribution, clinical judgement, violence risk assessment, decision-making

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Investigating the Influence of Causal Attributions on Both the Worksheet and Checklist Versions of the HCR-20.

Attribution theories posit that in order to understand the cause of our own or others' behaviours, we will apply either an internal or an external explanation for the behaviour (Forsterling, 1988). When an internal cause is attributed to an individual's behaviour, such as personality or temperament, the individual is often considered to be in control of or responsible for their behaviour (Murray & Thomson, 2009). Conversely, when the cause of an individual's behaviour is attributed externally, for example as a result of the environment, the behaviour is considered to be less in the individual's control and their level of responsibility for the outcome is therefore perceived to be low (Murray & Thomson, 2009).

The current research aimed to investigate whether the Historical Clinical Risk Management-20 (HCR-20; Webster, Douglas, Eaves & Hart, 1997) would be affected by attribution effects, whether the way in which it is completed will affect the outcome of the risk assessment, and whether attribution effects will differ depending on the way in which the HCR-20 has been completed. Attribution effects are a common form and well researched decision making bias which is known to influence intuitive clinical-forensic risk assessment judgements (Murray, Thomson, Cooke, & Charles, 2011; Quinsey & Cyr, 1986). What is less well known is whether this bias will influence risk judgements made using the HCR-20. It is thought that through using violence risk assessment tools, such as the HCR-20, the level of objectivity in risk judgements made will be raised (Dixon &

Oyebode, 2007), increasing the traceability of judgements by providing a structure to the risk assessment and reducing the propensity for biased judgements.

Violence Risk Assessment and the HCR-20

The HCR-20 is one of the most widely researched, commonly used, and leading structured professional judgement (SPJ) violence risk assessment tools (Lamont & Brunero, 2009), designed for use in assessing generalised violence across both forensic and civil populations (Canter & Zukauskiene, 2008). It comprises twenty items which form three sub-scales: the Historical Scale, which includes ten static, historical risk factors; the Clinical Scale, containing five items which are concerned with current, dynamic risk factors; and the Risk Management Scale, which includes five items that are concerned with future, post-assessment, situational or individual risk factors. A further breakdown of the items these scales actually comprise is shown in Tables 3-5, or can be found described in great detail in Webster *et al.* (1997).

SPJ tools, such as the HCR-20, do not aim to predict future violence, but instead aim to guide the clinician through the risk assessment using risk factors derived from both empirical and practice-based evidence and inform suitable risk management plans and interventions. The risk assessment is therefore composed in a way that is transparent and does not sideline the clinician's expertise.

The HCR-20 should be completed in conjunction with the HCR-20 manual (Webster *et al.*, 1997) and a 'worksheet' is often used to facilitate this. The worksheet guides the user in gathering information, to consider the presence and relevance of risk factors associated with the case, consider different hypothetical scenarios of violence

(best-, most realistic-, worst-case scenarios), develop risk management strategies suitable to the case, and finally to document their summary judgements. Spaces are provided underneath each risk item where the clinician can provide evidence from the case supporting their assertions of whether the item is present, to what extent and whether its presence (or lack of) is of relevance to the risk assessment. In presenting and combining the evidence in this way, it is thought that decision making will potentially be less biased. However, not all clinicians use the worksheet in practice (Slesser, 2009), or indeed the manual (this is not best practice, however, as the manual should be used to guide all assessments); the HCR-20 is at times used purely as a checklist, where the twenty factors are numerically coded on a 0-2 scale. In both the checklist and worksheet formats, the assessor should also formulate a final risk judgement indicating whether the person poses a low, moderate or high risk.

It is the fuller worksheet approach which should be used in practice. In contrast, using the HCR-20 in a summed-checklist manner has been supported by numerous studies, which focused on the checklist's predictive validity (e.g., Dolan & Doyle, 2000; Douglas, Ogloff, & Hart, 2003; Gray, Hill, McGliesh, Timmons, MacCulloch, & Snowden, 2003). However, Webster *et al.* (1997) pointed out that using summed scoring in clinical practice makes little sense as potentially important information generated through information searching would be lost. Webster *et al.* (1997) further proposed that a clinician may assess an individual based on only a small amount of information, with the example of a single item being used to conclude the level of risk posed, and that it is

the way in which the risk factors are combined, rather than the number of risk factors present in the assessment, that is important.

While the predictive validity of the HCR-20 used as a checklist has been demonstrated (Dolan & Doyle, 2000; Douglas, Ogloff, & Hart, 2003; Gray, Hill, McGliesh, Timmons, MacCulloch, & Snowden, 2003), it is unknown whether the scoring of the HCR-20 items differ when using the HCR-20 worksheet to provide evidence of the level of risk posed compared to using the HCR-20 purely as a checklist. To our best knowledge, there is no research investigating the discrepancy between the way in which the HCR-20 is intended for use in practice (i.e., to use it as a guide to structure a full risk assessment) and the way that it is most often researched and sometimes used in practice (i.e., used purely as a checklist with a numerically coded scale). The current research therefore aims to investigate whether completing the HCR-20 using the worksheet will elicit different numerical scoring than when using it purely as a checklist. If this is indeed the case, implications for the validity of using the HCR-20 as a checklist in research, as is generally the case, would have to be raised.

Attribution Effects in Violence Risk Assessment

Garfield and Garfield (2000) stated: "Before a guideline becomes a standard, it is important to evaluate whether it reduces uncertainty in medical decisions, eliminates decision making biases, applies to complex cases, and improves patient outcomes." (p.1058). Within the violence risk assessment literature, very little research exists which explicitly investigates the impact of known decision making biases on risk assessments; though much discussion is present concerning the quality of clinical judgement and

decision making in the area (Litwack, 2001). One decision making bias which has been investigated both explicitly and in a less direct manner is attribution bias (Murray, Thomson, Cooke, & Charles, 2011; Quincey & Cyr, 1986) and the related investigation into causality (e.g., Kim & LoSavio, 2009; Meehl, 1973).

Attribution bias occurs when judgements are made about a person or situation but greater or lesser weight is placed on internal or external factors, skewing the viewpoint formed. Attribution is an evolved decision making strategy designed to help us handle the vast volumes of social information encountered in everyday situations (Heider, 1958). However, issues may arise when the causal theories are influenced by erroneous or leading information. When information relating to an individual's internal state, such as mood or personality, is focused upon, internal causal theories about their behaviour tend to be formed (internal attribution) and their actions are attributed on something internal to that person. If, on the other hand, external or situational factors are focused on, the individual's behaviour is attributed to something external to them and outwith their control (external attribution).

Murray *et al.* (2011) and Quinsey and Cyr (1986) investigated attribution effects on unaided clinical assessments of risk. These studies found that individuals whose behaviour was described to imply more control over their actions (i.e., internally attributed) were considered more dangerous and to have committed a more serious crime than when the individual was described to emphasise the role of external factors on their behaviour (i.e., externally attributed), despite the description of the crimes and key features of the individual remaining constant across the internal/external conditions. In

order to investigate these attribution effects in relation to more modern risk assessment practice, it is crucial to identify whether attributionally manipulated information influences the scoring of SPJ tools, such as the HCR-20, or whether this effect is confined to unaided clinical judgements.

Further to this, Meehl (1973) argued that knowing the 'cause' of an individual's behaviour makes this behaviour appear somewhat more understandable and, consequently, causes this behaviour to become 'normalised' by the observer and considered as more acceptable. In addition, Kim and LoSavio (2009) proposed that individuals may consider externally controlled events or causes precipitating an action to be perceived as more understandable than those that are considered to be internally controlled or driven. They further pointed out that while both internally and externally controlled factors are involved in influencing an individual's behaviour, externally controlled factors are often given greater sympathy and empathy than internal ones as they are more likely to be perceived as 'random' events that could happen to anyone.

Thus, should a clinician attribute greater causality to internal factors in a case they may consider the level of risk posed by the offender as higher than if they attributed external causality (Murray *et al.*, 2011). In the context of the HCR-20, should the clinician form an internal causal attribution to explain an offender's behaviour, they may be more likely to consider that the offender had a Negative Attitude (in the Clinical Scale), instead attributing evidence of this to other, external causes, ultimately raising the final risk estimate. This in turn impacts on risk management plans and the offender's

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future treatment, and it is therefore of clear relevance and importance to understand whether attribution effects impact on violence risk assessments made using the HCR-20.

The current research therefore also aims to investigate the effects of internally and externally manipulated attributional information on the scoring of the HCR-20, and whether this differs across completing the HCR-20 as a checklist or using the worksheet format.

The following hypotheses are therefore proposed:

H_1 – The scoring of the HCR-20 will be subject to attribution effects.

H_2 – Attribution effects will be more apparent in the scoring of the HCR-20 when used as a checklist than when used with the worksheet. The checklist is more similar to unaided judgements as no additional evidence is required for its completion; which have previously demonstrated attribution errors in this context.

H_3 – Differences will exist between the scoring of the Historical, Clinical and Risk Management scales across the attribution conditions.

H_4 – Differences will exist between the scoring of the Historical, Clinical and Risk Management scales across the modes of completion for the HCR-20.

H_5 – The total score of the HCR-20 (all three scales summed) will be different across the checklist and worksheet.

Method

Design

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A 2x2 independent groups design was used, with the independent variables being the two modes of completion for the HCR-20 (checklist versus worksheet) and the two attributionally manipulated crime-based scenarios (internal versus external). The dependent variable was the numeric responses to the items measured on the HCR-20.

Participants

Forty participants were recruited from a university sample of psychology students. Of these, seven were male and 33 were female. Ages ranged from 20 years to 54years (mean age 28.6years). All had received educational training on the use of the HCR-20. The mean time spent in education was 17.5 years. Of the sample, 17 participants were studying at Masters level forensic/mental health psychology and 23 were studying a forensic/abnormal psychology module at final year BSc (Hons) level. All students were enrolled on BPS accredited courses. A t-test to investigate possible differences in the overall HCR-20 scoring between these two student groups was found to be non-significant ($t(37) = -1.412$, $p = 0.166$), indicating that the responses given by these two student groups were not significantly different from one another. All participants spoke English as a first language. Participants were randomly assigned to conditions. All participants had received a two-hour lecture on risk assessment broadly, with a focus on the use of the HCR-20. They had also received a tutorial style lesson in which they received basic training on how to use it and assessed fictitious cases. While this is clearly not to the same standard as full HCR-20 training courses, the participants represented those who would potentially be entering practice at entry level positions (e.g., assistant

psychologists or trainee psychologists), so were thought to be representative of an early-career/novice practitioner.

Materials

Participants received standardised information sheets, a consent form, instruction sheets, and a demographics questionnaire asking for: their gender, age, their highest educational qualification, and at what level of university study they were currently enrolled.

Attributionally manipulated vignettes. A one page standardised court copy-charge that described an assault charge was given to all participants, which was followed by an attributionally manipulated vignette. The copy-charge contained basic factual information on the assault, including the reason for the offender's arrest and a date for court summons. The copy-charge also detailed two previous charges of assault for which the individual within the vignette had been admonished.

Participants then read either a one page internally or externally manipulated vignette. The vignette provided details about the assault and the offender written in plain language, describing an 18 year old Caucasian male, 'Gary', who had forced entry into an elderly female neighbour's home in pursuit of a small amount of money. Gary was described as assaulting the woman for 40 minutes leading to injury and stopping her from alerting help. Both the internally and externally manipulated scenarios began with a section describing Gary's past history and his current situation. This section included information on pre-offence history and background. Information about the individual's previous offences, work related history, schooling history, employment details, family

history, economic background, current relationship status, age, gender, and the individual's relationship status to the victim was included. The information was presented in the same order throughout the passage to avoid primacy/recency effects impacting on weighting of information. This was followed by a section describing the offence and the outcome of the offence to the victim (injury), and a section detailing how the offender felt about the offence post-occurrence. The latter section describing the assault was standardised across the two versions of the scenarios; only the first section detailing the past history and current situation of the offender was subject to attributional manipulation.

The external attributional manipulation placed greater focus on situational factors surrounding the case and the internal manipulation placed greater focus on factors personal to the offender, such as mood and personality. For example when describing Gary's relationships with others and employment status the external version describes Gary's unsuccessful attempts to seek these, whereas the internal version focuses on his attitudes towards these. Information on his financial status and family background were also manipulated in this manner. This form of attributional manipulation was developed from vignettes presented within Quinsey & Cyr's (1986) early work on attribution in violence risk assessment judgements.

The scenarios used were adapted from real case notes and have been used successfully in previous research by the research team (e.g., Murray *et al.*, 2011). The original construction of the vignettes also followed guidance given in the vignette development methods papers (Ashill & Yavas, 2006; Heverly, Fitt, & Newman, 1984). In

line with the guidance given in these papers, the two versions of the vignettes were kept at approximately the same length, contained only information relevant to the study's focus, and contain consistent information (e.g., age, name, etc.) across the two versions, presented in the same order. The manipulated passages were no longer than half a typed page in size 12 Times New Roman font in order to maintain focus and reduce the chances of readers 'skimming' the passage due to perceived length. In addition, two clinical-forensic psychologists who are experts in risk assessment and experienced in research were asked to comment on the vignettes after initial construction and minor changes were made in order to improve validity.

The CDSII. McAuley, Duncan and Russell's (1992) Causal Dimension Scale (CDSII) measures attributional causality and was employed following the scenario in order to test the effectiveness of the internal/external manipulations and to encourage participants to think about the case in more detail prior to completing the HCR-20. It comprises 12 nine-point rating scales that yield four causal dimensions: Locus of Causality, External Control, Stability and Personal Control. The scales items and dimensions were used to assess aspects of the vignette, not the rater themselves, and vignette content was aligned with the items of the CDSII to allow the participant to answer all of the questions using the information given in the vignette. For the dimension Locus of Causality, participants are asked to rate on a 1-9 scale whether they feel that the cause of the offender's actions represent an aspect of the offender (rating 9) or an aspect of the situation (rating 1). For the Stability, participants rate whether they believe the cause of the behaviour is permanent (9) or temporary (1). For the External Control

dimension, participants rate whether the behaviour can be under the power of others (9) or not (1); and in the dimension Personal Control participants consider whether the action was manageable by the offender (9) or not (1). Reliability for the four dimensions was assessed using Cronbach's alpha. Only External Control obtained a low internal reliability (α=0.39). As such, findings pertaining to this dimension will not be presented.

The HCR-20. The HCR-20 was provided in either the checklist or the worksheet format. The HCR-20 is commonly used in research as a checklist. Some comparisons for the sake of clarity can be made between using the HCR-20 as a checklist and using it as a type of rough actuarial tool, where crudely the higher the final 'score' the higher the level of risk. Of course, this is certainly not how the HCR-20 was designed to be used, bu as the rating scale is often the way it is used in research (and possibly practice), this provided the rationale for including this format in the current study. In this format, the user responds to each of the 20 items with a numeric code (roughly: 0 if the item is not present, 1 if the item may be present or if more information is required, and 2 if the item is present). The worksheet version, on the other hand, is more akin to the SPJ approach (and the way that the HCR-20 has been designed for use and should be used in practice). In the current research, the worksheet condition required participants to provide additional written evidence to support their numerical ratings, with emphasis being on providing an evidenced written rationale. A final risk judgement of high-, medium-, or low- risk was also required for both checklist and worksheet conditions.

Procedure

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Participants were instructed to read through the information and instruction sheets and were invited to ask any questions prior to commencing the task. They read through the vignette and complete the CDSII. Further instruction was provided upon participants arriving at the HCR-20, with the numeric coding system being explained in full. Participants at this point were informed that should they desire, they may have access and use to the HCR-20 instruction manual (Webster *et al.*, 1997) to aid their assessment, as should be the case in real practice. It was left to the participant to decide whether or not to use this. After completing the HCR-20 participants completed the demographics questionnaire. Participants were not timed or asked to record how long it took them to complete the task, and so no time-related data were collected.

Results

To investigate the effectiveness of the attributional manipulations, 2x2 unrelated ANOVAs were carried out on the three reliable dimensions of the CDSII, with the fixed factors being internal versus external attribution and the Checklist versus the Worksheet versions of the HCR-20. The findings are displayed in Table 1.

Table 1 about here.

A significant main effect of attributional manipulation was found for the dimensions Locus of Causality $F(1, 36) = 6.70$, $p = 0.01$; $\acute{\eta}^2 = 0.16$ and Stability $F(1, 36)$

= 6.98, p = 0.01; $\acute{\eta}^2 = 0.16$, with offenders in the internal manipulation being viewed as more in control of their actions and more stable than their external counterpart. Ratings for Personal Control showed no trend. With the exclusion of Personal Control, the dimensions of the CDSII were rated in a manner consistent with expectations following the logical internal/external design of the vignettes. No significant main effects of the HCR-20 version or interactions were present indicating that the scoring of the CDSII did not differ across the two versions of the HCR-20 under investigation.

To test the five hypotheses, a series of 2x2 unrelated between groups' ANOVAs were carried out, with the independent variables being the internal/external attributional manipulations and the two 'versions' of the HCR-20 (checklist versus worksheet). The dependent variables were the scoring on the Historical, Clinical, and Risk Management scales of the HCR-20, and the total score. A significant main effect of attributional manipulation was found for the Historical scale $F(1, 36) = 15.80$, $p < 0.01$; $\acute{\eta}^2 = 0.30$, the Clinical scale $F(1, 35) = 14.69$, $p < 0.01$; $\acute{\eta}^2 = 0.27$, and for the overall scoring of the HCR-20 $F(1, 35) = 10.67$, $p < 0.01$; $\acute{\eta}^2 = 0.22$, indicating that the scoring of the HCR-20 and of its Historical and Clinical scales was not the same across the internal and external manipulations. The means for these analyses are given in Table 2.

Table 2 about here.

Participants scored the offender significantly higher in the internal manipulation than in the external one for the Historical and Clinical scales and for the overall HCR-20

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score. No main effect of attribution was found in the scoring of the Risk Management scale $F(1, 35) = 0.73$, $p = 0.40$; $\acute{\eta}^2 = 0.02$, indicating that participants scored the offender in a similar way across the internal and external scenario manipulations for these items.

These findings support H_1 (that the scoring of the HCR-20 would be subject to attribution effects) and partially support H_3 (i.e., differences exist between the scoring of the Historical and Clinical scales, respectively, across the internal and external scenario manipulations; however the Risk Management scale showed no differences).

No main effect of the 'version' of the HCR-20 used (checklist versus worksheet) was apparent in any of the three scales or the overall HCR-20 score, indicating no differences. H_4 (that differences would exist between the scoring of the Historical, Clinical, and Risk Management scales across the two versions of the HCR-20) and H_5 (that the overall scoring of the HCR-20 would be different across the checklist and worksheet versions) were therefore not upheld.

The only interaction between the attributional manipulation and the version of the HCR-20 used was found for the scoring of the Clinical scale $F(1, 35) = 4.71$, $p = 0.037$, as illustrated in Figure 1. In the checklist and worksheet formats for the HCR-20 the offender was scored more highly in the internal scenario manipulation than in the external one. However, it is clear that this difference is more apparent when the HCR-20 was used as a checklist. This would suggest that the Clinical scale is more prone to attributional biasing when the HCR-20 is used purely as a checklist than when it is used in the worksheet format. H_2 (the attributional manipulations would be more apparent in

the scoring of the shorter Checklist version of the HCR-20 than in the longer Worksheet version) was therefore partially supported.

Figure 1 about here.

To further explore the effect of attribution on the scoring of the HCR-20, simple frequency analyses investigating the number of participants rating the item as a '0', '1' or '2' were run per item and categorised according to attributional grouping. The findings are shown in Tables 3-5.

Table 3 about here.

Table 3 shows the frequency scoring of the Historical Scale items across the three scoring options and across the attributional manipulations. As shown, differences appear to be most prominent within the scoring for the items 'Previous Violence', 'Substance Use Problems', 'Psychopathy' and 'Personality Disorder'. Agreement on the other items was good across participants. In the item 'Previous Violence' the greatest differences in scoring was apparent in ratings of '0' and '1', with those in the internal attribution group producing more ratings of '1' and less for '0' than those in the external attribution group. In the scoring of 'Substance use Problems' participants in the external attribution condition produced more ratings of '0' (not present) than those in the internal condition – a finding that is particularly noteworthy given that no mention of drug or alcohol abuse

was made within the vignettes given. Another noteworthy finding in this item is that seven participants rated this as '2' indicating that they believed the item was a definite risk factor within the case. In relation to the items 'Psychopathy' and 'Personality Disorder', a greater proportion of participants within the external condition rated the items as '0', indicating that they were not a risk factor within the case. Given that the sample were not fully trained in assessing this and the short nature of the vignettes, this is a potentially concerning finding.

Table 4 about here.

Table 4 illustrates the frequency data relating to the Clinical scale items across the three scoring options and across the attributional manipulation conditions. Of these, the only notable differences in scoring are across the items 'Negative Attitudes' and 'Unresponsive to Treatment'. In the former it is observed that participants within the internal attribution condition considered Negative Attitudes (rating of '2') to be more prevalent within the case than those in the external condition. In the latter item participants within the internal condition considered that the individual depicted was potentially more unresponsive to treatment than those in the external condition (internal ratings were lower for '0' and higher for '1' than internal ratings).

Table 5 about here.

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Table 5 shows the frequency data relating to the Risk Management items across the three scoring options and across the attributional manipulation conditions. The only notable difference in scoring across the internal/external manipulations was in the item 'Exposure to Destabilisers'. The difference in scoring supports what would be expected in terms of attribution effects, with those in the external condition considering the exposure to destabilisers as a more prominent risk within the case than those in the internal condition (greater ratings of '2' and fewer '1' and '0' ratings within the external attribution condition than the internal condition).

A multivariate crosstabulation using the chi-square statistic was carried out to investigate whether there was any association between the final risk judgement (low-, moderate-, or high- risk) across the internal/external scenario manipulations in relation to the two 'versions' of the HCR-20. The results indicate that no association between the final risk judgement and the attributional manipulations existed in the worksheet format of the HCR-20 $\chi^2(2, N = 20) = 1.06$, $p = 0.59$ or the checklist format $\chi^2(2, N = 15) = 5.36$, $p = 0.07$. Thus, no differences were apparent in the final risk judgements made for the categories low-, moderate-, and high- risk across the internal and external manipulations when the HCR-20 was used as a checklist or in the worksheet format. This is further evidenced by the low adjusted residual values for all but one of the rows (Table 6).

Table 6 about here.

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In relation to the adjusted residuals, it can be seen that in the final risk judgements for the HCR-20 when used as a checklist there are more participants who rated the offender as a high risk in the internal scenario manipulation than in the external manipulation. This finding once again supports the idea that the HCR-20 is more prone to attribution effects when used as a checklist than when it is used in its worksheet format. Across both of these modes of completion for the HCR-20 and both the internal and external versions of the task, the majority of participants rated the offender to be a moderate risk (77%; 27/40 participants; Table 6). However, when using the worksheet format of the HCR-20, this value rises to 85% (17/20 participants) of participants rating moderate risk and lowers to 66% (10/15 participants – 5 did not respond to the question within this condition) of participants rating the offender a moderate risk when using the checklist format, with the second highest proportion of this latter group rating the offender as a high risk (27%; 4/15 participants).

Discussion

Attribution Findings

The current research raises important findings concerning attribution effects on clinical judgements. Given that the overall scoring of the HCR-20, the Historical scale and the Clinical scale was higher for the internal scenario manipulation than for the external manipulation, a number of conclusions can be drawn which support the results of Murray *et al.* (2011) and Quinsey and Cyr (1986). In addition, the overall pattern of

internal/external ratings of items support previous attribution research findings: those who have an internal attributional focus 'should' be considered to have more internal factors influencing their behaviour, such as attitudes. The finding that individuals completing the HCR-20 as a checklist rated the offender to be a 'high risk' more often in the internal manipulation than in the external one provides further evidence that attribution influences assessments of violence. These findings are of paramount importance as they highlight that even when using a SPJ tool, judgements can still be affected by attribution bias.

These findings, however, should be considered with caution as it is clear that the effect size, and therefore practical significance/magnitude, of the findings are small. The statistical significance should therefore be considered with some tentative appraisal when discussing the magnitude of this finding, and the overall strength of meaning behind it. Indeed, follow on research ought to investigate various levels of clinical expertise and use various vignettes in order to assess the robustness of these findings; ideally with larger sample sizes. However, the current findings could be viewed as a first step towards systematically investigating the effect of known decision making biases and errors on the completion of the HCR-20.

The current findings identified a number of areas where attribution effects may be more present within the HCR-20; both in terms of scale level and item level. As the HCR-20 is divided into three scales (Historical, Clinical, and Risk Management) the scales most affected by attribution can be identified. Attribution effects were present in the Historical and Clinical scales, but not in the Risk Management scale. In both of the

affected scales, numerical judgements of risk were higher in the internal manipulation than in the external one. Taking into consideration that the Historical scale contains ten items, all static risk factors, and that the Clinical and Risk Management scales each contain five dynamic risk items, it may be suggested that it judgements made relating to static risk factors are more affected by attributional manipulations than dynamic factors.

However, when this is considered at an item-level it becomes clear that the attribution related variation is across items is spread quite evenly across both the more static Historical Scale and the more dynamic Clinical and Risk Management Scales. It is therefore perhaps more useful to consider the item level differences in attribution-related scoring when considering methods to improve decision making and risk formulation using the HCR-20. Through raising awareness of where (which items) attribution effects are most prominent in during training with the HCR-20, there may be potential to reduce attribution effects on these items and in the overall risk judgement made. Given the limited scope of the frequency data presented here, however, it would be sensible to recommend additional research in this area with a larger sample of clinicians.

Through identifying the areas in which judgement is most affected by attribution effects and the areas where it is less affected, the current findings were able to demonstrate the clear benefit of using traceable, objective risk assessment tools, particularly in terms of informing and advancing knowledge for research purposes. By researching bias in judgements using violence risk assessment tools such as the HCR-20, the most affected areas of judgements in violence risk assessment can be identified and

therefore addressed. This has important implications for identifying potential areas of practice that could be targeted and improved.

An additional concern that was identified within the findings was the participant's ratings relating to the Historical item 'Substance Use Problems'. The vignettes made no mention of either substance or alcohol misuse (or indeed use). However, within the internal condition, only one participant rated this item as '0' – that the item was not present. While the majority of participants in the external attribution condition did rate this as a '0' (as should be the case), around half of participants considered that this item may be or definitely was a relevant risk factor to be considered. This is particularly concerning given the relatively brief vignettes given to participants, and given the fact that substance misuse is considered a key factor in recidivism (Howard, 2009). One possible explanation for this finding may be that participants were using their intuition and pre-conceptions to guide their formulation of the offender's profile, leading to them 'fill in the gaps' that were not discussed in the vignette with their own expectations (Pennington & Hastie, 1986; Pennington & Hastie, 1992). Indeed, it is well established within the decision making literature that when people are faced with a description which may be lacking in some details, they substitute this with information that they have come to accept as probable in certain situations (Pennington & Hastie, 1992), often leading to stereotyping (Stewart, Powell, & Chetwynd, 1979) and therefore potential errors in clinical judgement (Murray & Thomson, 2010).

A related concern stems from the participants' ratings for the items 'Psychopathy' and 'Personality Disorder', despite there being guidance that they should omit any items

for which they are not qualified or do not have any information on. Given that the sample used in the current research were still in training, it is concerning that many chose to rate the item as either a '2' indicating that it was definitely present, rather than omit the item as indicated in the HCR-20 guidance and in the instructions provided to participants. This may have been a result of the participants knowing that the project was simply a research study and not a 'real' risk assessment. However, this cannot be assumed and emphasises the importance of adequate training post-education for the HCR-20 when early-career practitioners are entering the workforce.

HCR-20 Version Findings

Concerning the scoring of the HCR-20 when used as a checklist compared to the worksheet, no significant differences were found. This would appear to be a positive indication for the applicability of existing research (which largely utilises the HCR-20 as a checklist) to practice, where it is the fuller worksheet adjunct to the HCR-20 manual that should be used. It can therefore be proposed that existing research investigating the HCR-20 is indeed applicable and generalisable to practice.

Generalisability, Limitations and Future Directions

An important issue concerning generalisability to practice relates to the vignettes: they may not have been of a sufficient length or detail to properly represent clinical practice. Keeping such information to a minimum is, however, a necessity in decision-making research of this nature in order to maintain control over the manipulated aspects. As this was the case, it was considered best practice not to impose on expert clinicians' already limited time for the present piece of research and instead use those in training in

order to first establish whether there is a need to follow up the study using a sample of clinicians; and indeed this would be beneficial. A related issue concerning the sample that must be considered when interpreting the results of the present study is the 'in training' or novice level of expertise that the participants had. All participants were undergoing training in forensic psychology and had some, but little, experience of carrying out risk assessments on a day to day basis. While the findings should be interpreted with this in mind, their potential importance to improving and understanding decision-making using the HCR-20 do indicate that a follow-up to the present study may be relevant, particularly in relation to the significant attribution effects on the overall scoring of the HCR-20 and on the Historical and Clinical scales. It would therefore be beneficial to utilise a sample of experts in a larger future study. This would identify with more confidence whether the present findings can be extended to an expert group.

Utilising an expert group would also enhance the validity of the findings in the way that the HCR-20 worksheet is completed. Given that the sample were novices, the way in which the worksheet was completed may not wholly represent clinical practice. For instance, while all participants in the worksheet condition did complete the worksheet by providing written rationale for their 'numerical' judgements, this largely (almost entirely) consisted of bullet pointed repetitions from the vignette information. Given that such short justifications, mainly repetitions, were provided by participants, qualitative analysis was deemed inappropriate. Future research in this area should seek to ensure that participants are engaging fully with the worksheet/rationale aspect of the HCR-20 in order to strengthen the comparison between worksheet and checklist, and to allow in-

depth qualitative analysis to be achievable. However, given that all participants did engage with the worksheet and provided some rationale for their numerical coding, the distinctive process between the worksheet and the checklist mode of completion was achieved.

The current findings further indicate that the scoring of the HCR-20 does not differ as a function of the checklist versus worksheet modes of completion. This finding is encouraging in terms of applying the findings of existing research, which utilised the HCR-20 as a checklist, to clinical practice. It further indicates that, provided that an adequate judgement of risk is made, no adverse effects to the risk management and intervention plans may occur. That is, of course, other than issues surrounding the level of accountability, traceability and dependability of the decision-making behind these plans. In addition, the present findings support and strengthen those of earlier research findings in the area, in that internally manipulated scenarios are rated higher in terms of risk than externally manipulated ones. Thus, attribution effects are not confined to only unaided judgements of violence risk assessment, but apply also to those made using SPJ tools. These effects were more prevalent in the scoring of static items (i.e., in the Historical scale) than dynamic ones (i.e., in the Clinical but not Risk Management scale). This finding is of particular importance as it allowed the identification of the factors most affected by attributional manipulations, thus supporting the need for using traceable, objective tools in both violence risk assessment research and practice.

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Table 1.

Table 1: Mean ratings for the dimensions of the CDSII across the internal and external scenario manipulations.

Causal Dimension	Attributional Manipulation	Mean	SD	N
*Locus of Causality	*Internal*	20.60	2.89	20
	External	17.65	4.07	20
*Stability	*Internal*	12.95	3.76	20
	External	1.10	3.01	20
Personal Control	*Internal*	19.90	3.46	20
	External	20.53	2.95	19

*Significant attribution effects to $p<0.05$.

Note: N<20 represent missing data.

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Table 2.

Table 2: Mean scores for the three scales of the HCR-20 and the mean total score of the HCR-20 across the internal and external scenario manipulations.

	Attributional Manipulation	Mean	SD	N
*Historical Scale	*Internal*	12.75	3.24	20
	External	9.50	1.67	20
*Clinical Scale	*Internal*	6.30	1.63	20
	External	4.47	1.50	19
Risk Management Scale	*Internal*	6.15	1.95	20
	External	6.68	1.70	19
*HCR-20 Score	*Internal*	25.20	5.41	20
	External	20.47	3.63	19

*Significant attribution effects to $p<0.001$.

Note: N<20 represent missing data.

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Table 3.

Table 3: Frequency of ratings for the Historical Items categorised across attribution conditions.

Historical Scale Item	Attributional Manipulation	Frequency per Scoring Option/Rating		
		0	1	2
Previous violence	*Internal*	7	7	6
	External	13	0	6
Young age at first violent incident	*Internal*	5	5	9
	External	4	7	8
Relationship instability	*Internal*	1	2	17
	External	0	3	15
Employment problems	*Internal*	0	3	17
	External	0	2	18
Substance use problems	*Internal*	1	13	6
	External	12	5	1
Major mental illness	*Internal*	5	13	2
	External	10	8	1
Psychopathy	*Internal*	2	13	3
	External	11	8	0

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Early maladjustment	*Internal*	0	3	17
	External	1	5	13
Personality disorder	*Internal*	0	3	16
	External	7	9	2
Prior supervision failure	*Internal*	3	6	10
	External	6	11	2

Note: some rows sum to fewer than 20 participants; this represents instances of missing data.

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Table 4.

Table 4: Frequency of ratings for the Clinical Items categorised across attribution conditions.

Clinical Scale Item	Attributional Manipulation	Frequency per Scoring Option/Rating		
		0	1	2
Lack of insight	*Internal*	0	12	8
	External	3	11	4
Negative attitudes	*Internal*	2	6	12
	External	5	8	4
Active symptoms of major mental illness	*Internal*	7	11	2
	External	8	8	1
Impulsivity	*Internal*	1	8	11
	External	0	6	12
Unresponsive to treatment	*Internal*	2	13	5
	External	9	4	3

Note: some rows sum to fewer than 20 participants; this represents instances of missing data.

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Table 5.

Table 5: Frequency of ratings for the Risk Management Items categorised across attribution conditions.

Risk Management Scale Item	Attributional Manipulation	Frequency per Scoring Option/Rating		
		0	1	2
Plans lack feasibility	*Internal*	2	10	5
	External	4	10	1
Exposure to destabilisers	*Internal*	2	12	6
	External	1	3	12
Lack of personal support	*Internal*	1	6	13
	External	0	2	17
Non-compliance with remediation attempts	*Internal*	3	10	6
	External	3	9	6
Stress	*Internal*	2	11	7
	External	0	7	12

Note: some rows sum to fewer than 20 participants; this represents instances of missing data.

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Table 6.

Table 6: Proportion of responses for each of the three final risk judgement options (low-, moderate- or high- risk) across the two versions of the HCR-20 (Worksheet versus Checklist).

Final Risk Judgement		Checklist Version		Worksheet Version	
		N(%)	Adjusted Residual	N(%)	Adjusted Residual
Low Risk	*Internal*	0 (0)	-1.1	0 (0)	-1.0
	External	1 (14)	1.1	1 (10)	1.0
Moderate Risk	*Internal*	4 (50)	-1.5	9 (90)	0.6
	External	6 (86)	1.5	8 (80)	-0.6
High Risk	*Internal*	4 (50)	2.2*	1 (10)	0.0
	External	0 (0)	-2.2*	1 (10)	0.0

*Adjusted residuals for High Risk (2.2) in the Checklist version of the HCR-20 exceed the critical value of 1.96.

Note: the number of participants who chose to provide a final risk judgement was 15, not the full 40 participants.

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Figure Caption:

Figure 1. Significant interaction between attributional manipulation and HCR-20 version for the Clinical Scale of the HCR-20.

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Figure 1.